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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,463	09/28/2006	Jyrki Kauppinen	1028443-000073	5051
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EXAMINER RICHEY, SCOTT M				
ART UNIT 2877		PAPER NUMBER		
NOTIFICATION DATE 07/09/2009		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

# Office Action Summary

**Application No.**

10/577,463

**Applicant(s)**

KAUPPINEN, JYRKI

**Examiner**

Scott M. Richey

**Art Unit**

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 April 2009.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-13 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 27 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/CDC)  
4) ☐ Interview Summary (PTO-413)  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_  
Paper No(s)/Mail Date \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 10 rejected under 35 U.S.C. 102(b) as being anticipated by Kauppinen (US 6,075,598 A), hereinafter "Patent '598." This new rejection of claim 10 is necessitated by the amendment changing the scope of the claim.

Patent '598 discloses a method in an interferometer, comprising: guiding optical beams through use of a first and a second angle reflector (12-14 and 13-14), constituted by plane reflectors, by reflecting the optical beams off the first and the second angle reflector (S1, S2); and guiding the optical beams reflected from the first and the second angle reflector through use of at least one end reflector (11', 11"), constituted by plane reflectors, by reflecting the optical beams off the at least one end reflector, and wherein an angle line of the at least one end reflector is perpendicular to an angle line of both of the first and the second angle reflector (see beam path in Fig.10); and changing an optical path difference between the optical beams by rotating the first and the second angle reflector around an axis (A in Fig.5).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patent '598, in view of Manning (US 6,469,790 B1).

As to claim 1, Patent '598 teaches an interferometer, as substantially shown in Fig.10, comprising: at least a beamsplitter (10); at least one end reflector for returning beams (11' and 11"); and a set of reflectors for reflecting the beams between the beamsplitter and the at least one end reflector (12, 13, and 14), said set of reflectors comprises a first and a second angle reflector, constituted by plane reflectors, and the first and the second angle reflector being rotatable around an axis (Configuration of Fig.10). While Patent '598 teaches that 11' and 11" are retroreflecting, the reference is silent to the end reflector comprising specifically a third angle reflector constituted by plane reflectors.

In exactly the same art of beam-splitting interferometers, Manning teaches, as substantially shown in Fig.20, a beamsplitter (32), right-angle reflectors (70, 70-A), and at least one end reflector (80), wherein said at least one end reflector is a third angle

reflector constituted by plane reflectors, and an angle line of the at least one end reflector is arranged perpendicular to an angle line of both of the first and second angle reflector. Manning states that "[this configuration] may be used advantageously for known purposes which may include [...] optical subtraction." It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate the roof mirror, as configured in the apparatus of Manning, within the apparatus of Patent '598 for the advantage of providing a four-port configuration which advantageously can be used in optical subtraction.

As to claims 2-4, 8, 12, and 13, Patent '598 further teaches the interferometer:

(Claim 2) wherein each of the angle reflectors is constituted by two plane reflectors (12-14, and 13-14), between which is provided an angle of about 72-107 degrees (right angle, i.e. 90°);

(Claim 3) wherein the beamsplitter and the at least one end reflector are mounted on a first rigid structure (Fig.5, 20), and the first and the second angle reflectors are mounted on a second rigid structure which is adapted to be rotatable around an axis (15);

(Claim 4) wherein said set of reflectors further comprises at least one pair of plane reflectors (While 14 is part of both sets, there are two sets of plane-reflector pairs: 12-14, and 13-14.);

(Claim 8) wherein at least some of the reflectors are produced by replication  
(Product-by-process claims are not limited to the manipulations of the recited steps,

only the structure implied by the steps. As the structure is anticipated, as described above in the rejection of claim 1, so too is this limitation.);

(Claim 12) wherein each of the angle reflectors is constituted by two plane reflectors, between which is provided an angle of about 85-95 degrees (90°; see Fig.10); and

(Claim 13) wherein each of the angle reflectors is constituted by two plane reflectors, between which is provided an angle of about 90 degrees (See Fig.10).

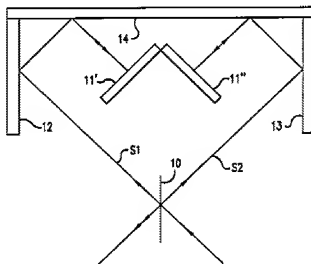


FIG.10

As to claims 5-7, Patent '598 teaches exactly the configuration of the claims except for laterally shifting the beam at the end reflector by utilizing a perpendicularly disposed angle reflector. Instead, the reference utilizes an ordinary retroreflector. See Fig.10, provided above. As discussed above, in the combination of Patent '598 in view of Manning, elements 11' and 11'' of Patent '598 would be replaced with roof mirrors such as those in Fig.20 of Manning (element 80). Manning uses the roof mirror to

laterally shift the beam at the end reflector to produce two usable output interference beams. The combination would advantageously allow optical subtracting, or compensation of various modulations of the light.

It would have been obvious to one of ordinary skill in the art at the time of invention to utilize the roof mirror (80) of Manning within the apparatus (Fig.10) of Patent '598 for the advantage of allowing optical subtracting, or compensation of various modulations of the light.

As to claim 9, Patent '598 teaches first and second angle reflectors as discussed above. The plane surfaces are arranged in one solid body (Fig.5, 15; Fig.10, 12-14), such that each angle reflector is a right-angle reflector (Fig.10). Given its broadest reasonable interpretation, the three surfaces appear to anticipate the "four plane surfaces" from the claim. Firstly, elements 12-14 are at least functionally equivalent to the four plane surfaces as they are used as two separate angle reflectors within a rigid body, similar to the applicant's figures 4a-4c and 5a-5c. Secondly, the claim does not preclude the four plane surfaces from being shared or overlapping surfaces. Thirdly, the claimed surfaces omit their boundaries. In other words, the claim does not preclude the arbitrary naming of surface boundaries in the middle of element 14, thereby having in fact four different surfaces.

Should it be found that these interpretations are not valid, and Fig.10 does not anticipate four plane surfaces, the limitation is at the least obvious in view of other embodiments within the reference. Specifically, Fig.2, Fig.4, Fig.7, and Fig.8 all teach four separate plane surface reflectors for use as angle reflectors. Given that the

reference teaches 90° reflectors in Fig.10, it would have been obvious to utilized the four separate plane surface mirrors of Figs. 2, 4, 7, and 8 for the configuration of Fig.10 as it has been held that combining known elements within a known apparatus to achieve predicted results is within the purview of one possessing ordinary skill, basic creativity, and common sense.

As to claim 11, Patent '598 teaches an analyzer, comprising: an interferometer (Fig.10) comprising at least a beamsplitter (10), at least one end reflector for returning beams (11', 11"), and a set of reflectors for reflecting the beams between the beamsplitter and the at least one end reflector (12-14), said set of reflectors comprises a first and a second angle reflector, constituted by plane reflectors, the first and the second angle reflector being rotatable around an axis (Fig.5, 15). While Patent '598 teaches that 11' and 11" are retroreflecting, the reference is silent to the end reflector comprising specifically a third angle reflector constituted by plane reflectors.

In exactly the same art of beam-splitting interferometers, Manning teaches, as substantially shown in Fig.20, a beamsplitter (32), right-angle reflectors (70, 70-A), and at least one end reflector (80), wherein said at least one end reflector is a third angle reflector constituted by plane reflectors, and an angle line of the at least one end reflector is arranged perpendicular to an angle line of both of the first and second angle reflector. Manning states that "[this configuration] may be used advantageously for known purposes which may include [...] optical subtraction." It would have been obvious to one of ordinary skill in the art at the time of invention to incorporate the roof mirror, as configured in the apparatus of Manning, within the apparatus of Patent '598



for the advantage of providing a four-port configuration which advantageously can be used in optical subtraction.

### ***Response to Arguments***

The applicant's arguments, filed 16 April 2009, with respect to claim 10 have been considered but are moot in view of the new grounds of rejection necessitated by the amended of claim 10.

The applicant's arguments have been fully considered but they are not persuasive:

Features upon which applicant relies (e.g., that "the deviation angle can be made significantly smaller than the deviation angle of the '598 interferometer") are not set forth in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims.

The applicant argues that the Manning reference fails to teach sufficient motivation for the roof reflector, i.e. for the reason of decreasing the deviation angle of the interferometer. *Deviation angles* are not set forth in the claim in a way so as to overcome the applied art.

The applicant also argues that Manning teaches additional elements that may or may not be necessary elements. The additional elements in the art references are not precluded by the rejected claims as set forth.

### ***Conclusion***

Several prior art references are made of record, though not relied upon, as they are considered pertinent to applicant's disclosure.

The retro-reflectors of Fig.1 in US 4,915,502 might anticipate the applicant's angled-end mirrors. Even if they do not, replacing the retro-reflectors with angle mirrors (merely a type of retro-reflector) would be an obvious step. The reference then would render obvious the applicant's independent claims.

Fig.7 of US 5,148,235 appears to teach many of the claims. The main difference appears to be a shared axis of rotation between elements 71 and 72. The device would function with a well chosen shared axis of rotation. The claims would likely be obvious over this reference in view of Patent '598.

The claims as set forth would likely be obvious over a combination of Figs. 5-8 of US 5,159,405.

The claims as set forth would likely be obvious over US 6,842,252 (See Fig.1) in view of the several retro-reflecting end angle mirrors in interferometer art already of record.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott M. Richey whose telephone number is (571) 270-1296. The examiner can normally be reached on Monday - Thursday, 10:00 - 17:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Toatley can be reached on (571) 272-2059. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Scott M. Richey  
Patent Examiner, Art Unit 2877

/Patrick J Connolly/  
Primary Examiner, Art Unit 2877